disposed successively on said substrate such that said substrate absorbs at least some of said light from said active region, said substrate doped throughout with a plurality of impurities such that said impurities simultaneously absorb the light of said active layer and each re-emits more than one color of light.

E2

16. A light emitting diode (LED), comprising:

an active region;

a pair of oppositely doped layers on opposite sides of said active layer which cause said active region to emit light at a predetermined wavelength in response to an electrical bias across said doped layers; and

E3

a doped substrate, said active region and doped layers disposed successively on said substrate such that said substrate absorbs at least some of said light from said active region, said substrate doped with a plurality of impurities such that it absorbs the light of said active layer and re-emits more than one color of light, wherein said active region emits UV light, and said substrate is doped by a plurality of rare earth or transition elements in a plurality of separate color centers that each absorbs UV light and re-emits a different color of light, the emission of said active layer being controllable such that said active layer can emit primarily over a selected one or more of said color centers.

25. A method for generating light from a solid state light emitting device, comprising:

providing a light emitting diode having an active layer surrounded by a pair of oppositely doped layers, all of which are disposed on a doped substrate that is doped with a plurality of impurities, each of which comprises a

E4

separate color center;

exciting an optical emission from said active layer within a first wavelength range;

E4

selectively applying at least a portion of said optical emission to one or more of said separate impurity color centers to stimulate emission from said doped substrate within different wavelength ranges depending on said plurality of impurities color centers; and

transmitting a combination of said optical emission and substrate emission as said LED's light.

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30. A nitride based light emitting diode, comprising:

a plurality of active layers each of which is capable of emitting light at a predetermined wavelength;

a means for selectively causing each of said plurality of active layers to emit light alone or in combination with others of said plurality of active layers; and

E5

a doped substrate, said plurality of active layers arranged vertically on said substrate with a plurality of doped semiconductor layers with each of said active layers sandwiched between two doped layers, said substrate absorbing at least some of said light from at least one of said plurality of active layers and re-emitting light at a different wavelength.

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37. The LED of claim 30, wherein said means for causing each of said plurality of active layers to emit omnidirectional light being capable of causing different ones of the active layers to emit omnidirectional light such that the light emitting from said LED comprises the light emitting from at least one of said plurality of active layers or the light emitting from at least one of

E6

E6

said plurality of active layers in combination with the light emitted from said doped substrate.

41. A light emitting diode, comprising:

an active layer;

a pair of oppositely doped layers on opposite sides of said active layer which cause said active layer to emit light at a predetermined wavelength in response to an electrical bias across said doped layers; and

E7

a doped substrate, said active layer and doped layers arranged in a stack on said substrate, said substrate absorbing at least some of said light from said active layer and re-emitting light at a different wavelength, said substrate doped throughout with a plurality of impurities such that said substrate absorbs the light from said active layer, and re-emits more than one color of light.

42. A light emitting diode, comprising:

an active layer;

a pair of oppositely doped layers on opposite sides of said active layer which cause said active layer to emit light at a predetermined wavelength in response to an electrical bias across said doped layers; and

a doped substrate, said active layer and doped layer arranged in a stack on said substrate such that said substrate absorbs at least some of said light from said active layer and re-emits light at a different wavelength, and wherein said substrate is doped throughout with chromium, titanium, and cobalt, said doped substrate absorbing said UV light and emitting red, green, and blue light.

43. A light emitting diode, comprising:

an active layer;

a pair of oppositely doped layers on opposite sides of said active layer which cause said active layer to emit light at a predetermined wavelength in response to an electrical bias across said doped layers; and

E7

a doped substrate, said active layer and doped layer arranged in a stack on said substrate such that said substrate absorbs at least some of said light from said active layer and re-emits light at a different wavelength, and wherein said substrate is doped by one or more rare earth or transition element in a plurality of separate color centers each of which absorbs UV light and re-emits a different color of light.

55. The LED of claim 54, wherein said means for causing each of said plurality of active layers to emit light further comprises an n-type layer contact and a plurality of p-type layer contacts, said n-type layer contact contacting said n-type layer and each of said plurality of p-type contacts contacting a respective one of said plurality of p-type layers.

E8

REMARKS

Drawings

The examiner objected to FIG. 6 because blue and yellow light are shown as emitting from the active layer 67. However, as noted by the examiner, the specification teaches that blue light is emitted from active layer 67, and part of the blue light is absorbed in the downconverting material 66 and re-emitted as yellow light. The arrow showing yellow light was intended by the applicants to show blue light that is downconverted and re-